AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method for deciding a semi-S curve for processing tone scale of a digital image, comprising steps of:

a) analyzing tone scale distribution of said image to decide a weighting value of high occurrence color;

b) analyzing tone scale of said image and deciding a transition point TP for the semi-S curve through steps of: making a histogram of tone scale, making summation of samples probability F_n (n=0 ~ Mg, in which Mg is a maximum tone scale value of the image format) of pixel sample number locating in each tone scale (0 ~ Mg), making a summation of samples probability of image from the darkest level (tone scale 0) till the sum $\sum F_n$ (n=0~N) reaching a value of 1/P, in which P is a predetermined parameter, and obtaining the position of transition point TP at the tone scale N;

c) deciding a shadow portion color enhancement curve O-TP of the semi-S curve locating before the transition point TP, the curve O-TP passing through origin point O(0,0) ~~of the histogram~~, the transition point TP and a maximum downward offset point determined by a maximum downward offset D_1 calculated as follows:

$D_1=C_1\ (2P[[F_1]]\underline{F_L})-1)$ when $(2P[[F_1]]\underline{F_L}-1<0$, and

$D_1=0$ when $(2P[[F_1]]\underline{F_L})-1\geq 0$

in which $[[F_1]]\underline{F_L} = \sum F_n$ $(n=0-(N/2)$, C_1 is a predetermined constant; and

d) deciding a light portion color enhancement curve TP-E of the semi-S curve locating after the transition point TP, the curve TP-E passing through an end point, the transition point TP and a maximum downward offset point determined by a maximum upward offset D_2 calculated as follows:

$D_2=C_2\ (1-2P[[F_2]]\underline{F_H})/P-1)$ when $(1-2P[[F_2]]\underline{F_H}-1\geq 0$, and

$D_2=0$ when $(1-2P[[F_2]]\underline{F_H})/(P-1<0$

in which $[[F_2]]\underline{F_H} = \sum F_n$ $(n=(N+Mg)/2-Mg)$, C_2 is a predetermined constant;

whereby, the semi-S curve composed of the curve O-TP and the curve TP-E is obtained.

2. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein said histogram of tone scale is a bar chart of each tone, in which the horizontal axis shows the tone value (0~Mg), while the vertical axis shows the amount of pixel samples for each tone in the image.

3. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein said samples probability F_n is a summation of pixel samples of tone-scale n.

4. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are RGB pixels.

5. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are standard RGB pixels.

6. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are YC_rC_b pixels.

7. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are Luv pixels.

8. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are LCH pixels.

9. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 3 wherein said pixel samples of image are in CIE Lab or Munsell system.

10. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein said parameter P is a positive number less than one.

11. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein said transition point locates on an intersection point of the semi-S curve and a 45° line passing through said origin as an original curve.

12. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 11 wherein said image is in RGB system, said shadow portion color enhancement curve locating under said original curve includes a

maximum downward offset point vertically deviating from said original curve with a maximum downward offset D_1.

13. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 11 wherein said image is in RGB system, said light portion color enhancement curve locating beyond said original curve includes a maximum upward offset point vertically deviating from said original curve with a maximum upward offset D_2.

14. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein coordinate of said transition point TP is (N,N).

15. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein coordinate of said end point of the light portion color enhancement curve is (Mg, Mg).

16. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 1 wherein said step a) further comprises steps of: weighting those high occurrence colors in said image, which larger areas of single

color or extreme similar color value, and rearrange and analysis the histogram of tone scale.

17. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 16 wherein said step of weighting high occurrence color is to analyze the histogram, find out larger area of single color, multiply the area LR with a weighting value $F(W_f)$, and rearrange a histogram according to the multiplication result.

18. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 16 wherein said weighting value $F(W_f)$, is decided on a threshold LR_{th} for judging larger area which meets high occurrence condition, so that area smaller than the threshold LR_{th} will get a weighting value "1", while area larger than the threshold LR_{th} will get a weighting value between 0 to 1.

19. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 18 wherein said weighting value $F(W_f)$ is linearly decreased according to the area LR as follows:

$F(W_f)=1$ when $LR < LR_{th}$, and

$F(W_f) = 1 - (LR - LR_{th}) / (1 - LR_{th})$ when $LR \geq LR_{th}$

20. (Original) A method for deciding a semi-S curve for processing tone scale of a digital image according to claim 18 wherein said weighting value $F(W_f)$ is non-linearly decreased according to the area LR.